UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,363	11/20/2006	Irina V. Shcherbakova	50821/1	2408

7590 02/27/2008

Kevin B Laurence
Stoel Rives
One Utah Center Suite 1100
201 So Main Street
Salt Lake City, UT 84111

EXAMINER	
JAISLE, CECILIA M	

ART UNIT	PAPER NUMBER
1624	

MAIL DATE	DELIVERY MODE
02/27/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/552,363	SHCHERBAKOVA ET AL.	
	Examiner	Art Unit	
	CECILIA M. JAISLE	1624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02-13-2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED OFFICE ACTION

Rejections Under 35 USC 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the claimed compounds and their pharmaceutically acceptable salts, does not reasonably provide enablement for complexes thereof. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

The claims, insofar as they embrace complexes, are not enabled. The specification prophesizes complexes (paragraphs [0013, 0152, 0160, 0169, 0172, *inter alia*), but the numerous examples presented all fail to show production of a complex. The term "complex" is undefined in the specification. A complex, generally referred to as a "coordination compound" or "metal complex," is a structure consisting of a central atom or molecule weakly connected to surrounding atoms or molecules. This specification contains no disclosure of how to form complexes of the 3H-pyrimidin-4-ones or what complexes are intended.

This circumstance shows the "specification is evidence of its own inadequacy" (*In re Rainer*, 153 USPQ 802, 807). Complexes cannot be simply be willed into existence. *Morton International Inc. v. Cardinal Chemical Co.*, 28 USPQ2d 1190 states:

> The specification purports to teach, with over fifty examples, the preparation of the claimed compounds with the required connectivity. However ... there is no evidence that such compounds exist ... the examples of the '881 patent do not produce the postulated compounds ... [T]here is ... no evidence that such compounds even exist.

Cancellation of the term "complex" from the claims will overcome this rejection.

Claims 17-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention. The specification states that the present compounds are calcilytics.

Many factors require consideration when determining whether sufficient evidence supports a conclusion that a disclosure satisfies the enablement requirement and whether any necessary experimentation is "undue." MPEP 2164.01(a). These factors include: (1) the claim breadth; (2) the nature of the invention; (3) the state of the prior art; (4) the level of predictability in the art; (5) the amount of direction provided by the inventor; (6) the presence of working examples; and (7) the quantity of experimentation needed to use the invention based on the content of the disclosure. *In re Wands*, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988)(reversing the PTO's determination that claims directed to methods for hepatitis B surface antigen detection did not satisfy the

enablement requirement). See also *In re Goodman* 29 USPQ2d 2010, 2013 (Fed.Cir. 1993). Application of these factors to the present application supports the determination that the present disclosure fails to satisfy the enablement requirement:

1. **Breadth of the claims:**

(a) Scope of the compounds. The claims cover potentially millions of 3H-pyrimidin-4-ones compounds.

(b) Scope of the diseases covered. Claim 17 recites treatment of a disease characterized by abnormal bone or mineral homeostasis. In Claims 18 and 19, the diseases are selected from osteosarcoma, periodontal disease, fracture healing, osteoarthritis, rheumatoid arthritis, Paget's disease, humoral hypercalcemia malignancy and osteoporosis. Claim 20 recites a method of increasing serum parathyroid hormone levels in mammals.

2. **Nature of the invention and predictability in the art:** The invention is directed toward medicine and is therefore physiological in nature. It is well established that "the scope of enablement varies inversely with the degree of unpredictability of the factors involved," and physiological activity is generally considered to be an unpredictable factor. See *In re Fisher*, 166 USPQ 18, 24 (CCPA 1970).

Pharmacological activity in general is unpredictable. In applications involving physiological activity, such as the present:

> The first paragraph of 35 U.S.C. §112 effectively requires that the scope of the claims must bear a reasonable correlation to the scope of enablement provided by the specification to persons of ordinary skill in the art.

Plant Genetic Systems v. DeKalb Genetics Corp., 65 USPQ2d 1452 (CAFC 2003).

3. **Direction and Guidance:** That provided is very limited. The dosage range information is meager at best. It is generic, the same for all disorders the specification covers. No specific direction or guidance provides a regimen or dosage effective specifically for all of the conditions construed by the claims.

4. **State of the prior art:** Nemeth, J. Molec. Endocrin., 2002, 29, 15-21, cautions regarding calcilytics:

> All the evidence obtained to date supports the view that the parathyroid Ca2+ receptor is a viable target for drugs which could have anabolic effects on bone. ... Perhaps the most challenging aspect of this new approach to treating osteoporosis will be achieving the necessary pharmacokinetic features of rapid absorption and elimination to cause a transient increase in circulating levels of PTH [parathyroid hormone].

Fox, Current Opinion in Pharm, 2002, 2: 338-344, noted the anomalous results:

> ...NPS 2143 [a calcilytic compound that stimulates PTH secretion] did not increase BMD [bone mineral density] because both bone formation and bone resorption were increased. This was presumably because NPS 2143 was long-lived in vivo and caused a more sustained increase in PTH levels than occurred with hormone injection. Bone mass was increased only when NPS 2143 was coadministered with the antiresorptive agent 17ß-estradiol.

Nemeth, Cell Calcium, 35 (2004) 283-289, cautions (p. 284), "... calcilytic compounds have yet to undergo extensive clinical testing and there are still some technical uncertainties regarding this approach to treating osteoporosis." Nemeth 2004 later observes (p. 288), "Together, the results of genetic studies in mice and in humans do not offer a compelling argument for attributing important physiological functions to the Ca2+ receptor beyond those involved in systemic Ca2+ homeostasis."

Stewart, N. Eng. J. Med. 351: 4, July 2004, 324-326, questions (P. 326) whether orally active calcilytics could be developed:

> Conversely, if a calcimimetic drug can lower the parathyroid hormone level, could one develop a drug that would block the calcium-sensing receptor and thereby stimulate parathyroid hormone secretion? That is could one develop an orally active "calcilytic" drug ..." This class of drugs is also under development for osteoporosis. When injected daily, parathyroid hormone is highly effective as an anabolic drug for the treatment of osteoporosis. If a calcilytic drug could be developed that would stimulate endogenous parathyroid hormone secretion, one might be able to receive the remarkable anabolic skeletal benefits of parathyroid hormone with a pill rather than requiring an injection.

Cunningham, J. Am. Soc. Nephrol. 18: 223-234, 2007, points to the need for further research with calcilytics generally:

> Calcilytics have a contrary effect of the CaR by decreasing sensitivity to calcium. When given to experimental animals or humans, these agents are associated with an abrupt increase in endogenous PTH secretion with augmentation of bone formation, thus mimicking the effect of intermittent daily injections of synthetic PTH. The potential for exploiting these cyclical changes is clear.

Thus, the prior art recognizes the need for further research with methods such as those of the present claims.

5. **Working Examples:** Applicants do not provide highly predictive competent evidence or recognized tests to treat all conditions recited for the claims. Applicants provide no competent evidence that all of the 3H-pyrimidin-4-one compounds will effectively treat all of the diseases, conditions and symptoms construed by the claims. Furthermore, Applicants have not provided competent evidence that the instantly disclosed tests are highly predictive for all uses disclosed and embraced by the claim language for all of the intended hosts.

6. Skill of those in the art: Nemeth 2002, Fox, Nemeth 2004, Stewart and Cunningham confirm the need for further search with calcilytics generally.

7. Quantity of experimentation needed to make or use the invention. Based on the disclosure's content, an undue burden would be placed on one skilled in the pharmaceutical arts to make and use the invention, since the disclosure gives the skilled artisan inadequate guidance regarding pharmaceutical use, for reasons explained above. The state of the art, as discussed in the articles referenced above, indicates the requirement for undue experimentation, particularly with regard to potentially devastating side effects. Thus, the ability of a calcilytic agent to ameliorate all of the diseases/conditions/symptoms recited by the present claims remains open to further study and proof.

Substantiation of utility and its scope is required if utility is "speculative," "sufficiently unusual" or not provided. See *Ex parte Jovanovics, et al.*, 211 USPQ 907 (BPAI 1981). Also, *Hoffman v. Klaus*, 9 USPQ2d 1657 (BPAI 1988) and *Ex parte Powers*, 220 USPQ 924 (BPAI 1982) regarding testing types needed to support *in vivo* uses. Applicants' attention is drawn to the Revised Interim Utility and Written Description Guidelines, 66 FR 1092-1099 (2001), emphasizing that "a claimed invention must have a specific and substantial utility." See MPEP 2163, *et. seq.*

MPEP 2164.01(a) states,

> A conclusion of lack of enablement means that, based on the evidence regarding each of the above [Wand] factors, the specification, at the time the application was filed, would not have taught one skilled in the art how to make and/or use the full scope of the claimed invention without undue experimentation. *In re Wright*, 27 USPQ2d 1510, 1513 (Fed.Cir. 1993).

The above consideration clearly justifies that conclusion here and undue experimentation would be required to practice Applicants' invention. The consideration of the above factors demonstrates that the present application does not sufficiently enable the present claims. In view of the pharmaceutical nature of the invention, the unpredictability of relationship between calcilytics and specific diseases/conditions, one of ordinary skill in this art would have to undergo an undue amount of experimentation to use the instantly claimed invention commensurate in scope with the claims.

Rejections Under 36 USC 102

Claims 1, 2 and 8 are rejected under 35 USC 102(b) over Stajer, et al., Magyar Kemiai Folyoirat (**1986**), 92(5), 234-6, describing

4(1H)-Pyrimidinone, 2-phenyl- ;

4(1H)-Pyrimidinone, 2-(4-chlorophenyl)- ;

4(1H)-Pyrimidinone, 2-(3-chlorophenyl)- and

4(1H)-Pyrimidinone, 2-(4-methylphenyl)-.

Claims 1, 2, 3 and 8 are rejected under 35 USC 102(b) over Fulop, et al., Synthesis (**1985**), (12), 1148-9, describing

4(1H)-Quinazolinone, 2-(4-chlorophenyl)-5,6,7,8-tetrahydro- ;

4(1H)-Quinazolinone, 5,6,7,8-tetrahydro-2-(4-methoxyphenyl)-; and

4(1H)-Quinazolinone, 5,6,7,8-tetrahydro-2-(3-methoxyphenyl)-.

Claims 1, 2 and 8 are rejected under 35 USC 102(b) over Schubert, et al., Journal fuer Praktische Chemie (Leipzig) (**1970**), 312(3), 494-506, describing 4(1H)-Pyrimidinone, 2,5-diphenyl-.

Claims 1, 2 and 8 are rejected under 35 USC 102(b) over Sprio, et al., Ann. di Chim. (Rome, IT) (**1970**), 60(5), 393-6, describing 4(3H)-Pyrimidinone, 2,6-diphenyl-.

Claims 1, 2, 4, 6, 8 are rejected under 35 USC 102(b) over Kato, et al., Yakugaku Zasshi (**1970**), 90(4), 509-11, describing
4(3H)-Pyrimidinone, 6-methyl-2-phenyl-; and
4(1H)-Pyrimidinone, 6-methyl-2-(4-methylphenyl)-.

Claims 1-3, 7 and 8 are rejected under 35 USC 102(b) over Mitter, et al., Quart. J. Indian Chem. Soc. (**1927**), 4, 149-57, describing
4(1H)-Quinazolinone, 5,6,7,8-tetrahydro-2-phenyl-; and
4(1H)-Quinazolinone, 5,6,7,8-tetrahydro-2-(4-methylphenyl)-.

Claims 1, 2 and 8 are rejected under 35 USC 102(b) over Mitter, et al., Quart. J. Indian Chem. Soc. (**1925**), 2, 61-70, describing
5-Pyrimidinecarbonitrile, 1,4-dihydro-4-oxo-2-phenyl- ;

5-Pyrimidinenitrile, 1,4-dihydro-4-keto-2-p-tolyl-.

Claims 1, 2 and 8 are rejected under 35 USC 102(b) over Mitter, et al., Journal of the Chemical Society, Transactions **(1923)**, 123, 2179-84, describing 4(1H)-Pyrimidinone, 2-(4-methylphenyl)-.

Claims 1, 2, 4, 6 and 8 are rejected under 35 USC 102(b) over Arai, et al., Heterocycles **(2001)**, 55(12), 2283-2287, describing
4(3H)-Pyrimidinone, 6-methyl-3-(4-methylphenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 3-(4-methylphenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 6-methyl-2,3-diphenyl-;
4(3H)-Pyrimidinone, 2,3-diphenyl-;
4(3H)-Pyrimidinone, 3-(4-chlorophenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 2-(4-methylphenyl)-3-phenyl-; and
4(3H)-Pyrimidinone, 3-(4-methoxyphenyl)-2-phenyl-.

Claims 1, 2, 4, 6 and 8 are rejected under 35 USC 102(b) over Tice, et al., Tetrahedron **(2001)**, 57(14), 2689-2700,I describing 4(3H)-Pyrimidinone, 5-methyl-2,3-diphenyl-6-(trifluoromethyl)-.

Claims 1, 2, 4 and 8 are rejected under 35 USC 102(b) over Jayakumar, et al., Tetrahedron Letters **(2001)**, 42(11), 2235-2237, describing

4(3H)-Pyrimidinone, 6-ethyl-5-methyl-3-(4-methylphenyl)-2-phenyl-; and 4(3H)-Pyrimidinone, 6-ethyl-5-methyl-2,3-diphenyl-.

Claims 1, 2, 8 and 9 are rejected under 35 USC 102(b) over Rossi, et al., Tetrahedron (**1999**), 55(22), 6921-6970, describing 4(3H)-Pyrimidinone, 5-chloro-2,6-diphenyl-3-(phenylmethyl)-.

Claims 1, 2, 8 are rejected under 35 USC 102(b) over Mukherjee, et al., Heterocycles (**1998**), 47(2), 933-950, describing
5-Pyrimidinecarbonitrile, 1,6-dihydro-6-oxo-1,2-diphenyl-;
5-Pyrimidinecarbonitrile, 1-(4-chlorophenyl)-1,6-dihydro-6-oxo-2-phenyl.

Claims 1, 2 and 8 are rejected under 35 USC 102(b) over Tice, et al. (Tice I), US 5726124, issued Mar. 10, 1998, describing compounds of Formula I (col. 2, line 5 – col. 6, line 44, *inter alia*) as weed herbicides. Note compounds 15, 20, 41, 79, 115, 241, 127, 185, 203-210, 230, 243 and 244, *inter alia*.

Claims 1, 2 and 8 are rejected under 35 USC 102(b) over Tice (Tice II), US 5300477, issued Apr. 5, 1994, describing compounds of Formula I (col. 2, line 5 – col. 6, line 27, inter alia) for control of weeds. Note compounds 15, 20, 41, 79, 115, 241, 127, 185, 203-210, 230, 243 and 244, *inter alia*.

Claims 1, 2 and 8 are rejected under 35 USC 102(b) over Rossi, et al., Tetrahedron (**1997**), 53(41), 14107-14114, describing 4(3H)-Pyrimidinone, 3-(4-methylphenyl)-2,6-diphenyl-.

Claims 1, 2, 8 and 9 are rejected under 35 USC 102(b) over Holzer, et al., Liebigs Annalen der Chemie (**1994**), (9), 901-9, describing 5-Pyrimidinecarbonitrile, 1,6-dihydro-6-oxo-2,4-diphenyl-1-(phenylmethyl)-.

Claims 1, 2, 4, 5, 8 are rejected under 35 USC 102(b) over Mazumdar, et al., Tetrahedron (**1994**), 50(25), 7579-88, describing 4(3H)-Pyrimidinone, 5-bromo-3-(4-chlorophenyl)-2-phenyl-.

Claims 1, 2, 4, 8 and 16 are rejected under 35 USC 102(b) over Gupta, et al., India Patent 158084, issued Aug. 30, 1986, describing

4(3H)-Pyrimidinone, 3-(4-methylphenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 6-methyl-2,3-diphenyl-;
4(3H)-Pyrimidinone, 2,3-diphenyl-;
4(3H)-Pyrimidinone, 3-(2-fluorophenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 3-(3-fluorophenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 3-(4-fluorophenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 3-(2-chlorophenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 3-(3-chlorophenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 3-(4-chlorophenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 3-(2-methylphenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 3-(3-methylphenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 3-(2,6-dichlorophenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 3-(5-chloro-2-methylphenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 3-(2-chloro-6-methylphenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 2-phenyl-3-[3-(trifluoromethyl)phenyl]-;
4(3H)-Pyrimidinone, 3-[1,1'-biphenyl]-2-yl-2-phenyl-;

4(3H)-Pyrimidinone, 3-(4-nitrophenyl)-2-phenyl-;
4(3H)-Pyrimidinone, 3-(2-fluorophenyl)-6-methyl-2-phenyl-;
4(3H)-Pyrimidinone, 2,3,6-triphenyl-;
4(3H)-Pyrimidinone, 3-(2-fluorophenyl)-2,6-diphenyl-;
4(3H)-Pyrimidinone, 3-(2-chlorophenyl)-2,6-diphenyl-;
4(3H)-Pyrimidinone, 3-(3-chlorophenyl)-2,6-diphenyl-;
4(3H)-Pyrimidinone, 3-(4-chlorophenyl)-2,6-diphenyl-;
4(3H)-Pyrimidinone, 3-(2-methylphenyl)-2,6-diphenyl-;
4(3H)-Pyrimidinone, 3-(3-methylphenyl)-2,6-diphenyl-;
4(3H)-Pyrimidinone, 3-(4-methylphenyl)-2,6-diphenyl-;
4(3H)-Pyrimidinone, 3-(2,6-dichlorophenyl)-2,6-diphenyl-;
4(3H)-Pyrimidinone, 3-(5-chloro-2-methylphenyl)-2,6-diphenyl-;
4(3H)-Pyrimidinone, 3-(2-chloro-6-methylphenyl)-2,6-diphenyl-;
4(3H)-Pyrimidinone, 2,6-diphenyl-3-[3-(trifluoromethyl)phenyl]-;
4(3H)-Pyrimidinone, 3-[1,1'-biphenyl]-2-yl-2,6-diphenyl-; and
4(3H)-Pyrimidinone, 3-(2-chlorophenyl)-6-methyl-2-phenyl-,

as anti-inflammatories.

Claims 1, 2, 4, 6, 8 and 16 are rejected under 35 USC 102(b) over Ruschig, et al., US 3185689, issued May 25, 1965, describing (col. 1, lines 12-43, inter alia) 3-phenyl-4(3H)-pyrimidinones and their salts as analgesic and antipyretic agents. Note particularly 4(3H)-pyrimidinone, 6-methyl-2-phenyl-3-o-tolyl-, hydrochloride and 4(3H)-Pyrimidinone, 2-phenyl-6-propyl-3-o-tolyl-, hydrochloride.

Rejections Under 35 USC 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 2, 4-6, 8 and 16 are rejected under 35 USC 103(a) over each of Tice I and Tice II, each taken separately, discussed above. The Tice compounds render obvious lower alkyl homologs and positions isomer thereof, encompassed by the present claims. The skilled chemist would be well motivated to prepare other compounds and their compositions homologous and isomeric with those of Tice according to the procedures taught therein with the expectation that such compounds would have the same herbicidal activity.

It would have been obvious to one of ordinary skill in the art at the time the present invention was made to modify the compounds of Tice to prepare compounds homologous and isomeric therewith. One of ordinary skill in the art would have been motivated to prepare the instantly claimed compounds because such structurally homologous and isomeric compounds are expected to possess similar herbicidal properties to the Tice compound. It has been held that compounds that are structurally homologous and isomeric to prior art compounds are *prima facie* obvious, absent a showing of unexpected results.

> An obviousness rejection based on similarity in chemical structure and function entails the motivation of one skilled in the art to make a claimed compound, in the expectation that compounds similar in structure will have similar properties.

In re Payne, 203 USPQ 245, 254 (CCPA 1979). See *In re Papesch*, 137 USPQ 43 (CCPA 1963) and *In re Dillon*, 16 USPQ2d 1897 (Fed.Cir. 1991) (discussed in MPEP § 2144) for an extensive case law review of obviousness based on close structural chemical compound similarity. See MPEP § 2144.08, ¶ II.A.4(c). Compounds which are homologs (compounds differing regularly by the successive addition or subtraction of the same chemical group, e.g., by -CH3 or lower alkyl groups) or position isomeric, as here, are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties. *In re Wilder*, 195 USPQ 426 (CCPA 1977).

Claims 1, 2, 4-6, 8 and 16 are rejected under 35 USC 103(a) over Gupta, discussed above. The Gupta compounds render obvious lower alkyl homologs and

positions isomer thereof, encompassed by the present claims. The skilled chemist would be well motivated to prepare other compounds and their compositions homologous and isomeric with those of Gupta according to the procedures taught therein with the expectation that such compounds would have the same herbicidal activity. See the discussion above of the obviousness of such closely structurally related compounds their salts and compositions.

Claims 1, 2, 4-6, 8 and 16 are rejected under 35 USC 103(a) over Ruschig, discussed above. Note that Ruschig describes that the 3-phenyl group is substituted by R2, R3 and R4, which may be, inter alia, a hydroxy group and by a halogen group. The Ruschig compounds render obvious 3-phenyl-4(3H)-pyrimidinones and their salts substituted on the phenyl with hydroxy and/or halo, inter alia, as well as lower alkyl homologs and positions isomer thereof, their salts and compositions, encompassed by the present claims. The skilled chemist would be well motivated to prepare other compounds and their compositions homologous and isomeric with those of Ruschig according to the procedures taught therein with the expectation that such compounds would have the same herbicidal activity. See the discussion above of the obviousness of such closely structurally related compounds their salts and compositions.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CECILIA M. JAISLE, J.D. whose telephone number is

(571)272-9931. The examiner can normally be reached on Monday through Friday; 8:30 am through 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be reached on 571-272-0661. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James O. Wilson/
Supervisory Patent Examiner
Art Unit 1624

CECILIA M. JAISLE, J.D.
2/13/2008